

or nickel, and the thermally sprayed material is chromium oxide or nickel/chromium oxide with the chromium oxide coating the nickel.

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REMARKS

In response to the action, applicants have amended claims 3, 11 and 13. Applicants respectfully request reconsideration in view of the amendment and the following remarks.

The action objected to claim 11 for an incomplete reference back to its antecedent basis. In response to this, applicants amended claim 11 to "the fiber reinforced polymer substrate with" as suggested by the Examiner.

The action rejects claims 1, 3, 5, 9 and 13 under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the invention. In particular, the action rejects claims 3 and 13 for containing the "/" and "+" notations. In response to this, applicants amended the claims to the non-abbreviated language "bisphenol F-type epichlorohydrin and diethylenetriamine" as suggested by the Examiner. It is unclear to the applicants what is unclear with respect to claims 1, 5 and 9--a review of claims 1, 5 and 9 did not locate any clarity issues. In view of the above amendment, applicants respectfully submit that claims 3 and 13 are sufficiently clear under 35 U.S.C. § 112, second paragraph.

The action rejects claims 1, 2 and 4 to 10 under 35 U.S.C. § 103(a) as being unpatentable over Hatch et al.'s U.S. Pat. No. 5,840,386. Hatch et al. discloses a two-layer polymer coating for use with a metal sleeve. The first layer is an expandable polymer that acts as a bladder for inflating with air to expand the second polymer layer and secure a metal sleeve in place. The patent teaches that it is advantageous to use a thermal spray-coated metal sleeve for these applications. Unlike Hatch et al., applicants' two polymer layer design operates without the benefit of a metal sleeve or an expandable polymer layer. Applicants claim a first polymer layer free of fibers and particulate, a second polymer layer containing particulate and a thermal spray layer coating the second polymer layer. Hatch et al.'s patent is related to a metal sleeve-containing design and does not disclose or suggest a first polymer layer free of fibers and particulate, a second polymer layer containing particulate or a thermal spray layer coating the second polymer layer. Therefore, since Hatch et al. do not disclose

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W/draw req
of 5+9

claims do not
show such
negative
limitations

→ doesn't teach
invention

A2
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or suggest a first polymer layer free of fibers and particulate, a second polymer layer containing particulate or a thermal spray layer coating the second polymer layer, applicants respectfully submit that claims 1, 2 and 4 to 10 are not obvious over Hatch et al. under 35 U.S.C. § 103(a). FR

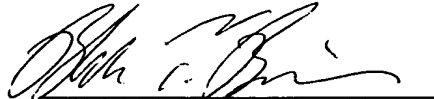
The action rejects claims 1 to 12 and 14 to 16 under 35 U.S.C. § 103(a) as being unpatentable over Hatch et al.'s U.S. Pat. No. 5,840,386 in view of Hess et al., U.S. Pat. No. 3,698,053. Hess et al. disclose a carbon fiber reinforced polymer. And it does not disclose or suggest a first polymer layer free of fibers and particulate and a second polymer layer containing particulate with a thermal spray layer coating the second polymer layer. As discussed above, Hatch et al. also does not disclose applicants' claimed multi-layered polymer for receiving a thermal spray coating. Therefore, since Hatch et al. and Hess et al. do not disclose or suggest a first polymer layer free of fibers and particulate and a second polymer layer containing particulate with a thermal spray layer coating the second polymer layer, applicants respectfully submit that claims 1 to 12 and 14 to 16, as amended, are not obvious over Hatch et al. in view of Hess et al. under 35 U.S.C. § 103(a). Hatch does show

The action rejects claims 1, 3, 11 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Hatch et al.'s U.S. Pat. No. 5,840,386 in view of Hess et al., U.S. Pat. No. 3,698,053 and in further view of Fujita et al. U.S. Pat. No. 5,296,582. Fujita et al. disclose a bisphenol F-type epichlorohydrin and diethylenetriamine resin. But Fujita et al. do not disclose using this resin to bond a particulate-containing polymer to a fiber reinforced composite. This resin has excellent properties for bonding a particulate-containing polymer to a fiber-containing polymer and it withstands the indirect thermal stresses induced from thermal spraying a coating on to the particulate-containing polymer layer. Thus, since Fujita et al. fail to disclose using a bisphenol F-type epichlorohydrin and diethylenetriamine resin for bonding a particulate-containing polymer to a fiber-containing polymer or withstanding indirect thermal stresses from thermal spraying, applicants respectfully submit that claims 1, 3, 11 and 13, as amended, are patentable over Hatch et al. in view of Hess et al. and in further view of Fujita et al. intended use

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In summary, applicants respectfully submit that all pending claims are in proper form for allowance. Applicants respectfully request reconsideration and allowance of the remaining claims.

Respectfully submitted



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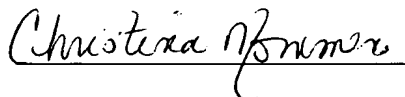
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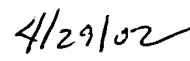
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Appendix

3. (Amended) The fiber reinforced composite of claim 1 wherein the first polymeric layer is a two component epoxy resin of bisphenol F-type ~~/epichlorohydrin~~ and diethylenetriamine.

11. (Amended) A fiber reinforced composite material comprising: a fiber reinforced polymer substrate; a first epoxy layer coating the fiber reinforced polymer substrate for joining two different polymeric composites, the first epoxy layer being free of fibers and particulate; a second epoxy layer coating the first epoxy layer, the second epoxy layer comprising an epoxy matrix and a particulate within the epoxy matrix; and at least one thermally sprayed material coating the second epoxy layer to form an adherent multi-layer coating attached to the fiber reinforced polymer substrate, the multi-layer coating being attached to the fiber reinforced polymer substrate with a tensile strength of at least about 10 MPa.

13. (Amended) The fiber reinforced composite of claim 12 wherein the first and second epoxy material is a bisphenol F-type ~~/epichlorohydrin~~ and diethylenetriamine, the particulate material in the second epoxy layer is aluminum or nickel, and the thermally sprayed material is chromium oxide or nickel/chromium oxide with the chromium oxide coating the nickel.